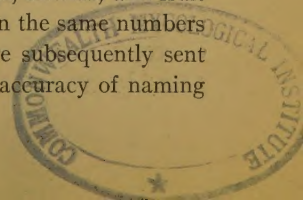
Reprinted from the *Botanical Gazette*, 39: 385–396, June, 1905

LEGUMINOUS RUSTS FROM MEXICO.

J. C. Arthur.

The following thirty-seven species of Uredinales, represented by 128 numbered collections, are, with two exceptions, part of the rich fruits of three vacation trips into Mexico, made by Mr. E. W. D. Holway in 1898, 1899, and 1903. Some of the material secured on these excursions has already been reported upon by Mr. Holway in an article in this journal (**31**:326–338. 1901), which included descriptions of thirty-one new species; a still earlier trip, made in 1896, was also reported by Mr. Holway in this journal (**24**:23–38. 1897), in which forty-five new species of Uredineae were described, the descriptions being drawn by Dr. P. Dietel, and with two species of ascomycetous fungi, one being the type of a new genus. Much material remains to be studied, which will undoubtedly yield many more new species.

The amount of excellent material secured by Mr. Holway within the limited periods at his command shows him to be a collector of unusual activity and acumen. His specimens are ample, and as a rule contain the various spore stages, or all that could reasonably be expected to occur at one season of the year. Another most commendable feature in making these collections is the care taken to secure the exact determination of the host whenever feasible. Not only are bits of the inflorescence and fruit included, but whenever the host is in any way unfamiliar, specimens suitable for the phanerogamic herbarium are taken illustrating the foliage, flowers, and fruit of the plants as well as possible. These are given the same numbers as used for the fungi found on them. They are subsequently sent to specialists for determination, by which means accuracy of naming



is insured; incidentally also the leading herbaria of the country have been enriched with many valuable specimens, while not a few new species of flowering plants have been brought to light.

The collections made by Mr. HOLWAY show that Mexico has an abundant rust flora, and especially so in the groups represented by the genera Ravenelia and Uropyxis. If collections made during September, October, and November, and over a comparatively small part of that great country have proved so interesting and valuable, more extended search is likely to be rewarded with almost or quite equal results for some time to come.

The following enumeration includes the portion of Mr. HOLWAY'S uredineous collections in Mexico, not heretofore published, possessing leguminous hosts, *i. e.*, the rusts occurring upon members of the families Fabaceae, Cassiaceae, and Mimosaceae.

1. UROMYCES TRIFOLII (A. & S.) Lev.—On *Trifolium amabole* HBK., Jalapa, Oct. 3, 1898, no. 3091: *Trifolium* sp., Pachuca, Oct. 27, 1903, no. 5245; City of Mexico, Oct. 28, 1899, no. 3746.

2. UROMYCES MEDICAGINIS-FALCATAE Wint.—On *Medicago denticulata* Willd., Toluca, Sept. 19, 1898, no. 3129.

3. **Uromyces rugosa,** n. sp.—Uredosori hypophyllous, cinnamon-brown; uredospores globoid, 20–24 by 21–27μ; wall light yellow, medium thick, 2–2.5μ, minutely and sparsely verrucose, pores 8, scattered: teleutosori hypophyllous, small, round, 1^{mm} or less across, scattered or somewhat gregarious, soon naked, pulverulent, dull chocolate-brown; teleutospores broadly oval or globoid, 18–22 by 21–27μ, wall dark chestnut-brown, medium thick, 2–3μ, rugose or irregularly and closely verrucose, apex usually bearing a very low, hyaline umbo; pedicel colorless, short, fragile, mostly deciduous. —On *Lupinus* sp., Amecameca, Oct. 21, 1903, no. 5208.

The very rough and opaque spores easily separate this species from all others reported from North America on Lupinus. The uredo stage was not well shown on the specimens studied, and is consequently incompletely described.

4. **Uromyces montanus,** n. sp.—Teleutosori hypophyllous, small, round, crowded in circinating groups, 5–10^{mm} across, centripetal in development, early naked, cinnamon-brown or darker, usually cinereous from germination; teleutospores oval or obovate, pale, 18–24 by 30–40μ, wall very pale brownish, smooth, thin, 1–1.5μ,

thickened at apex, 5–7μ, pedicel colorless, thick, as long as the spore or shorter.—On *Lupinus mexicanus* HBK., Nevada de Toluca, 10,400^{ft} alt., Oct. 16, 1903.

This collection also showed well-developed aecidia of *Uromyces Lupini* B. & C. upon the same leaves. The teleutospores germinate in the sorus upon maturity.

5. Uromyces Lupini B. & C.—On *Lupinus elegans* HBK., Toluca, Sept. 19, 1898, no. 3177: *Lupinus* sp., Pachuca, Oct. 5, 1899, no. 3575; Zapotlan, Oct. 9, 1903, no. 5140; Nevada de Toluca, Oct. 15, 1903, no. 5154; Amecameca, Oct. 21, 1903, no. 5209.

6. **Uromyces Cologaniae,** n. sp.—Uredosori hypophyllous, scattered, round, small, 0.25^{mm} or less across, soon naked, pulverulent, pale cinnamon-brown, ruptured epidermis barely noticeable; uredospores globoid, 16–23 by 20–27μ, wall pale cinnamon-brown, thin, 1.5–2μ, evenly and minutely echinulate, pores 3–4, equatorial: teleutosori hypophyllous, scattered, round, small, 0.25^{mm} across, soon naked, pulverulent, cinnamon-brown, ruptured epidermis barely noticeable; teleutospores oval or globoid, 16–20 by 18–26μ, rounded at both ends, wall cinnamon-brown, thin, 1.5–2μ, closely and finely verrucose, apex a little thicker or with a very low, pale umbo, 2–4μ; pedicel colorless, short, fragile; mostly deciduous.—On *Cologania pulchella* HBK., Patzcuaro, Oct. 20, 1898, no. 3192 (type); Toluca, Sept. 20, 1898, no. 3179; Uruapam, Oct. 11, 1899, no. 3615: *C. congesta* Rose, Toluca, Sept. 20, 1898, no. 3179: *C. affinis* Mart. & Gal., Jalapa, Oct. 3, 1898, no. 3193: *Cologania* sp., Oaxaca, Oct. 21, 1899, no. 3703.

The determination of the several hosts was made by Dr. J. N. Rose of the U. S. National Museum, all with some slight question, as the material was far from complete.

7. Uromyces appendiculatus (Pers.) Unger.—On *Phaseolus vulgaris* L., City of Mexico, Oct. 15, 1898, no. 3049; Atequiza, State of Jalisco, Oct. 6, 1903, no. 5120: *P. retusus* Benth., near Tula, Sept. 20, 1898, no. 3161: *P. anisotrichus* Scheele, Rio Hondo, near City of Mexico, Sept. 22, 1898, no. 3155: *P. disophyllus* Benth., Chapala, Sept. 18, 1899, no. 3455: *P. coccineus* Jacq., City of Mexico, Oct. 9, 1898, no. 3037; Dos Rios, near City of Mexico, Sept. 22, 1898, no. 3094; Uruapam, Oct. 12, 1899, no. 3625: *P. obvallatus* Scheele, Santa Fé, near City of Mexico, Oct. 18, 1903, no. 5170;

Amecameca, Oct. 20, 1903, no. 5188: *P. atropurpureus* Moc., Iguala, State of Guerrero, Nov. 4, 1903: *Phaseolus* sp., Cuernavaca, Sept. 24, 1898, no. 3021; Cuautla, Oct. 12, 1898, no. 3070, and Oct. 22, 1903, no. 5217; near Tula, Sept. 21, 1898, no. 3187; Etla, State of Oaxaca, Oct. 23, 1899, no. 3729; Guadalajara, Sept. 22, 1903, no. 5021, Iguala; Nov. 4, 1903, no. 5336.

The Mexican collections of this species of rust do not vary in any noticeable way from those made in the United States. *Uromyces obscurus* D. & H. was founded on a Phaseolus rust having what was taken to be a peculiar form of Aecidium, but which proves to be a species of Synchytrium. This name is therefore a synonym of *U. appendiculatus*.

8. UROMYCES FABAE (Pers.) DeB.—On *Faba vulgaris* L., Toluca, Sept. 17, 1898, no. 3189; Patzcuaro, Oct. 13, 1899, no. 3628; and Oaxaca, Oct. 24, 1899, no. 3733.

9. UROMYCES TENUISTIPES D. & H.—On *Meibomia* sp., Dos Rios, near City of Mexico, Sept. 22, 1898, no. 3095; Toluca, Sept. 19, 1898, no. 3097; Cardenas, Oct. 22, 1898, no. 3148; Atequiza, State of Jalisco, Sept. 26, 1899, no. 3503.

The teleutospores are minutely rugose, although they appear smooth when wet. The apex of the spore has a very low, semihyaline umbo, which often disappears, leaving a shallow depression, as mentioned in the original description (BOT. GAZ. **24**:25. 1897).

10. UROMYCES MEXICANUS D. & H.—On *Meibomia* sp., Cuernavaca, Sept. 24, 1898, no. 3019, and Sept. 28, 1898, no. 3124; near Tula, State of Hidalgo, Sept. 21, 1898, no. 3195; Cardenas, State of San Luis Potosi, Oct. 22, 1898, no. 3150; Rio Hondo, near City of Mexico, Sept. 22, 1898, no. 3154; Chapala, Sept. 18, 1899, no. 3447.

11. UROMYCES HEDYSARI-PANICULATI (Schw.) Farl.—On *Meibomia amplifolia* (Hemsl.) Kuntze, Patzcuaro, Oct. 20, 1898, no. 3141: *M. elegans* (Desv.) Kuntze, Rio Hondo, near City of Mexico, Oct. 4, 1899, no. 3569: *M. strobilacea* (Schl.) Kuntze, Guadalajara, Oct. 12, 1903, no. 5146: *Meibomia* sp., City of Mexico, Oct. 14, 1898, no. 3048; Cuernavaca, Sept. 29, 1899, no. 3518 with uredospores only; Morelia, Oct. 14, 1899, no. 3633; Oaxaca, Oct. 18, 1899, nos. 3658, 3659, Oct. 23, 1899, nos. 3716, 3723, Nov. 11, 1903, no. 5385; Santa Fé, near City of Mexico, Oct. 18, 1903, no. 5165; Tlalpam, near City of Mexico, Oct. 19, 1903, no. 5180.

12. **Uromyces Clitoriae,** n. sp.—Uredosori hypophyllous; uredospores globoid, about 23–27μ in diameter, wall thick, 3μ, fuscous, evenly and sparsely echinulate, pores apparently 2: teleutosori hypophyllous, small, round, scattered, dark cinnamon-brown, soon naked; teleutospores ellipsoid, 20–24 by 22–30μ, wall chestnut-brown, evenly thick, 3–3.5μ, minutely and evenly verrucose; pedicel delicate, colorless, less than the length of the spore, caducous.—On *Clitoria mexicana* Link, Jalapa, Oct. 5, 1898, no. 3088.

Only a few uredospores were seen, which were found in parasitized sori. The sculpturing of the teleutospores is minute but very distinctly shown when dry.

13. **Uromyces bauhiniicola,** n. sp.—Spermogonia epiphyllous, gregarious, punctiform, fuscous, subepidermal, seen in section globose, 60–130μ in diameter: teleutosori at first hypophyllous, becoming amphigenous, small, round, about 1^{mm} in diameter, often confluent, early naked, blackish; teleutospores broadly oval or globoid, 15–21 by 20–24μ; wall dark chestnut-brown, semi-opaque, thick, 2.5–3.5μ, prominently rugose, thicker and paler at apex, 5–7μ; pedicel colorless, firm, as long as the spore.—On *Bauhinia Pringlei* Wats., Guadalajara, Sept. 28, 1903, no. 5060 (type): *Bauhinia* sp., Iguala, Nov. 4, 1903, no. 5334.

Readily distinguished from the four or five species occurring upon Bauhinia in South America by the very dark, rugose spores, unaccompanied by uredospores. The spores germinate somewhat readily in the sori, not long after maturity.

14. PHRAGMOPYXIS DEGLUBENS (B. & C.) Diet.—On *Brittonamra Edwardsii* (A. Gr.) Kuntze (*Cracca Edwardsii* A. Gray), Cuernavaca, Oct. 30, 1903, no. 5278.

This is the first time the host of this rare and interesting species has been definitely determined. It has only twice been reported before, once in Ecuador on an undetermined species of Coursetia, a genus closely related to Brittonamra. The type collection is recorded on "leaves of some leguminous plant," and is said to come from Texas (Grev. 3:55), which latter, however, must be an error. The specimen in the cryptogamic herbarium of Harvard University says, "Northern Sonora," and bears the collector's number, the same as recorded by BERKELEY in *Grevillea*. A specimen in the herbarium of the Department of Agriculture at Washington, D. C., says "N. Mexico," but does not bear the collector's number. Both of these specimens are undoubtedly part of the one original collection made by C. Wright. The Washington specimen consists of two leaflets, 5 by 12^{mm},

elliptical, entire, nearly smooth above, slightly hirsute below with scattered hairs, mucronate, short petioluled, texture firm, bearing a few, well-formed, amphigenous teleutosori. The specimen was compared, under the guidance of Dr. J. N. Rose, with specimens in the phanerogamic herbarium of the U. S. National Museum, but could not be matched.

The collection by Mr. Holway is furthermore noteworthy in possessing aecidia, not heretofore known, which are rather pale and inconspicuous. They may be described as follows: Aecidia hypophyllous, or somewhat amphigenous, crowded in small groups, pale yellow, without peridium, but sparingly encircled by incurved paraphyses; aecidiospores catenulate, globoid or globose-oblong, 13–17 by 15–19μ, wall very pale yellow, thin, 1μ, finely and closely verrucose, paraphyses small, cylindrical, 5–7 by 24–30μ, more or less contorted, wall usually thick, sometimes nearly obliterating the lumen, smooth, colorless: spermogonia epiphyllous, few in groups opposite the aecidia, brownish-yellow, punctiform, inconspicuous, subcuticular, conical, small, 60–80μ broad and half as high, ostiolar filaments 20–24μ long, free.

CALLIOSPORA, nov. gen.—Teleutosori arising from beneath the epidermis, soon naked; teleutospores 2-celled by transverse partition, wall colored, with an external layer which swells in water, germ pores 2 in each cell, lateral. Aecidium and uredo wanting. Spermogonia arising from beneath the cuticle, conical.

15. **Calliospora Holwayi,** n. sp.—Spermogonia epiphyllous, numerous over areas 2–7^{mm} across, punctiform, golden yellow, becoming brown, subcuticular, conical, 80–125μ broad: teleutosori epiphyllous, scattered, sometimes confluent, small, round, blackish-brown; teleutospores elliptical, 26–34 by 40–51μ, rounded at both ends, slightly or not constricted at the septum, inner wall chocolate-brown, thick, 3–4μ, pores two in each cell, outer wall colorless, 2–3μ thick in water, smooth; pedicel colorless, as long as the spore, swelling in water to the diameter of the spore and bursting.—On *Eysenhardtia amorphoides* HBK., Guadalajara, Sept. 28, 1903, no. 5059 (type), Sept. 29, 1903, no. 5068; Oaxaca, Oct. 25, 1899, no. 3737: *E. orthocarpa* Wats., Etla, State of Oaxaca, Nov. 13, 1903, nos. 5404 and 5405.

This species resembles *Uropyxis Eysenhardtiae* (D. & H.) Magn., but differs not only in the absence of the uredo, but in the position of the sori, the measurements of the teleutospores, and their smooth, colorless, outer wall. The collections have been examined by Dr. J. N. Rose, who says that the species of Eysenhardtia have not been sufficiently studied, and some doubt must attach to the determination of the several numbers.

16. **Calliospora Farlowii,** n. sp.—Spermogonia caulicolous, and sparingly on midrib of leaf, small, punctiform, yellowish-brown, conical, 80–100μ broad, ostiolar filaments 25–40μ long: teleutosori caulicolous, large, confluent, early naked, pulverulent, cinnamon-brown; teleutospores elliptical, 18–24 by 29–42μ, rounded at both ends, slightly or not constricted at the septum, inner wall cinnamon-brown, 2–3μ thick, pores 2 in each cell, outer wall colorless, barely noticeable when swollen in water, minutely verrucose; pedicel colorless, about 6μ thick, short and mostly deciduous.—On *Parosela domingensis* (DC.) Heller (*Dalea domingensis* DC.), Orizaba, Feb., 1888 (*W. G. Farlow*).

I am indebted to the collector for excellent material of this interesting species. In the selection of the specific name I take the opportunity of showing my appreciation of courtesies in sending me material, and also my high regard for the eminent services rendered by Dr. FARLOW to botanical science.

17. **Calliospora Diphysae,** n. sp.—Spermogonia amphigenous, crowded in dendritic groups, or disposed in lines, pale brown, bullate or hemispherical, subcuticular, 100–175μ broad and less than half as high: teleutosori amphigenous and caulicolous, round or elongated, 1–5^{mm} long, early naked, nearly black; teleutospores elliptical, 30–33 by 45–50μ, rounded at both ends, not constricted at septum, inner wall dark chestnut-brown, 3–4μ thick, pores 2 in each cell, outer gelatinous, pale amber-color, 3–4μ thick in water, sparsely and evenly verrucose; pedicel half length of spore or longer, colorless, firm above, at base slightly bulbous and swelling in water to bursting. —On *Diphysa suberosa* Wats., Rio Blanco, near Guadalajara, Sept. 30, 1903, no. 5082.

18. UROPYXIS NISSOLIAE (D. & H.) Magn.—On *Nissolia laxior* Rose, Guadalajara, Sept. 25, 1903, no. 5039: *N. hirsuta* DC., Sayula, State of Jalisco, Oct. 8, 1903, no. 5127; Cuautla, State of Morelos, Oct. 23, 1903, no. 5230: *Nissolia* sp., Cuernavaca, Nov. 1, 1903, no. 5309.

These collections, except the one made in November, show a few uredospores among the teleutospores. The uredospores are globoid or ellipsoid, pale yellow or nearly colorless, 12–16μ in diameter, wall very thin, 0.75μ, finely verrucose, pores very indistinct, few. The paraphyses seen are capitate, thin-walled, and colorless.

19. UROPYXIS DALEAE (D. & H.) Magn.—On *Parosela Dalea* (L.) Britt. (*Dalea alopecuroides* Willd.), Guadalajara, Sept. 26, 1903, no. 5048: *P. mutabilis* (Willd.) Rose, Toluca, Sept. 19, 1898, no. 3188; Amecameca, Oct. 20, 1903, no. 5196, Nov. 20, 1903, no. 5426: *P. acutifolia* (DC.) Rose, Cuautla, State of Morelos, Oct. 23, 1903, no. 5227: *P. Holwayi* Rose, Iguala, State of Guerrero, Nov. 3, 1903, no. 5319: *P. trifoliata* Rose, near Tacubaya, City of Mexico, Oct. 7, 1896, without number; Aguascalientes, Oct. 9, 1903, no. 7705 (*Rose & Painter*).

20. **Uredo Æschynomenis,** n. sp.—Sori mostly hypophyllous, grouped on small reddish spots, or scattered, subepidermal, small, globose, with pseudoperidium formed of imbricated paraphyses by the union of the slender stipes, the free capitate ends lining the inner wall, dehiscent by a central orifice; uredospores stylate, broadly elliptical or globoid, 14–18 by 16–23μ, wall pale yellow, thin, 1μ, very minutely verrucose, pores obscure, about 6, scattered.—On *Æschynomene americana* L., Cuautla, State of Morelos, Oct. 22, 1903, no. 5220.

The spores of this collection are much like those of *Uropyxis Nissoliae*, the hosts of the two species being closely related. But no genus of leguminous rusts known to the writer contains species with a pseudoperidium for the uredo. Until the teleutospores are discovered, it will be impossible to state the affinities of the species.

21. **Ravenelia Lysilomae,** n. sp.—Spermogonia epiphyllous, crowded in small groups, punctiform, rather large, pale brownish-yellow, subcuticular, flattened hemispherical, 80–130μ wide, one-fourth as high: teleutosori epiphyllous on pale spots, becoming amphigenous, small, 0.25–0.5^{mm} across, chestnut-brown, subepidermal, numerous hyphoid paraphyses intermixed with the spores, inconspicuous; teleutospore-heads chestnut-brown, 7–9 cells across, 80–120μ in diameter, smooth, cysts appressed beneath the head, extending from periphery to pedicel, united laterally; pedicel colorless, short, deciduous; paraphyses cylindrical, 7–10 by 30–40μ, light golden-brown, wall thin or rarely thick.—On *Lysiloma tergemina* Benth., Iguala, State of Guerrero, Nov. 3, 1903, no. 5317.

22. RAVENELIA VERRUCOSA Cke. & Ell.—On *Leucaena microphylla* Benth., Iguala, State of Guerrero, Nov. 3, 1903, no. 5314.

This collection differs slightly from the type in having heads almost or quite smooth, and with paraphyses fewer and paler.

23. RAVENELIA LEUCAENAE Long.—On *Leucaena diversifolia* Benth., Etla, State of Oaxaca, Nov. 13, 1903, no. 5408: *L. esculenta* DC., Etla, State of Oaxaca, Nov. 13, 1903, no. 5413; Iguala, State of Guerrero, Nov. 3, 1903, no. 5311: *Leucaena* sp., Guadalajara, Sept. 25, 1903, no. 5044; and Tehuacan, State of Puebla, Nov. 7, 1903, no. 5349.

There appears to be considerable uncertainty in the exact determination of the species of Leucaena. Although these numbers have been submitted to competent authorities, the correctness of the specific names employed here cannot be vouched for.

24. RAVENELIA EXPANSA Diet. & Holw.—On *Acacia filiculoides* (Cav.) Trel. (*A. filicina* Willd.), Iguala, State of Guerrero, Nov. 3, 1903, no. 5312: *A. cochliacantha* Humb. & Bonp., Iguala, State of Guerrero, Nov. 3, 1903, no. 5315; Tehuacan, State of Puebla, Nov. 8, 1903, no. 5353: *Acacia* sp., Yautepec, Oct. 24, 1903, no. 5237.

25. RAVENELIA SILIQUAE Long.—On *Acacia pennatula* Benth., Etla, State of Oaxaca, Nov. 14, 1903, no. 5395.

The type was seen by Mr. LONG only on the fruit, but the present collection, which does not differ in any perceptible way from the type, only shows rust on the leaves. No teleutospores could be found.

26. **Ravenelia gracilis,** n. sp.—Spermogonia amphigenous, punctiform, crowded in groups, prominent, subcuticular, hemispherical, 60–100μ broad and half as high: uredosori epiphyllous, scattered, less than 0.25^{mm} in diameter, nearly round, mamillose, dehiscent by central, irregular rupture, the encircling epidermis forming an aecidioid cup, paraphyses peripheral, or also intermixed with the spores; uredospores elliptical or obovate-oblong, 16–21 by 30–40μ, wall rather thin, 1.5–2.5μ, golden-brown, strongly and evenly echinulate, pores 4–6, equatorial; paraphyses hyphoid, 7–10 by 40–60μ, somewhat contorted, smooth, thin-walled, nearly or quite colorless: teleutosori like uredosori, but without paraphyses; teleutospore-heads chestnut-brown, 5–7 cells across, 75–100μ in diameter, each spore bearing 4–7 slender, nearly colorless tubercles, 3–4μ high; cysts delicate, appressed beneath the head, extending from periphery to pedicel, united laterally; pedicel short, colorless, deciduous.—

On an undetermined species of Mimosaceae, Cardenas, State of San Luis Potosi, Oct. 22, 1898, no. 3144½.

This rust has many characters in common with that on Pithecolobium, although the hosts do not appear to be closely related. The host is a thorny shrub or tree, with evenly twice pinnate leaves; the leaflets oblong, nearly glabrous, entire, about 3 by 7^{mm}. A cupulate gland usually occurs on the main rachis at the insertion of each pair of petioles.

27. **Ravenelia Pithecolobii,** n. sp.—Uredospores in the teleutosori elliptical or broadly oval, 15–18 by 24–30μ, wall golden-yellow, medium thick, 2–3μ, thicker at apex, 3–5μ, evenly verrucose, pores 4–6, equatorial: teleutosori amphigenous, small, round, at first bullate, scattered, subepidermal, chestnut-brown; teleutospore-heads chestnut-brown, 6–8 cells across, 70–90μ in diameter, each spore bearing 2–3 slightly curved tubercles, 5–7μ long, acute, pale brownish; cysts appressed beneath the head, extending from periphery to pedicel, united laterally; pedicel colorless, short, deciduous; paraphyses none.—On *Pithecolobium dulce* (Roxb.) Benth., Guadalajara, Sept. 27, 1903, no. 5051.

28. Ravenelia Mimosae-sensitivae Henn.—On *Mimosa stipitata* Rob., Cuautla, Morelos, Oct. 28, 1903, no. 5228; and Iguala, Nov. 4, 1903, no. 5326: *M. caerulea* Rose, Cuernavaca, Oct. 30, 1903, no. 5290: *M. Galeottii* Benth., Cuernavaca, Oct. 31, 1903, no. 5303: *M. polyanthoides* Rob., Iguala, Nov. 3, 1903, no. 5324: *M. albida* H. & B., Cuernavaca, Sept. 24, 1898, no. 3125, Oct. 29, 1903, no. 5265; and Cuautla, Oct. 20, 1903, no. 5213: *M. alba floribunda* Rob., Oaxaca, Nov. 10, 1903, no. 5368; Etzatlan, State of Jalisco, Oct. 2, 1903, no. 5086: *Mimosa* sp., Etla, State of Oaxaca, Nov. 16, 1903, no. A.

This species appears to be remarkably uniform on all the hosts so far reported for it. *Uredo sensitiva* Speg. (An. Mus. Nac. Buenos Aires **6**:236. 1899) is probably a synonym, judging from the description. All the numbers under this species were submitted to Dr. B. L. Robinson of the Gray Herbarium, who determined the hosts.

29. Ravenelia cassiaecola Atk.—On *Cassia* sp., Oaxaca, Nov. 10, 1903, no. 5359.

This species has not before been reported from Mexico, having been known only from the southeastern United States.

30. **Ravenelia inconspicua,** n. sp.—Uredosori hypophyllous, small, 0.5^{mm} or less across, subcuticular, soon naked, pulverulent, ruptured cuticle inconspicuous, paraphyses abundantly intermixed with the spores; uredospores globose or broadly elliptical, 15–20 by 15–22μ, wall medium thick, 2–2.5μ, golden-yellow, closely verrucose, pores about 10, scattered, paraphyses spatulate, smooth, cinnamon-brown, paler below, walls thick, 3–6μ: teleutosori hypophyllous, very small, scattered, blackish, shining, subcuticular; teleutospore-heads chestnut-brown, 6–8 cells across, 60–100μ in diameter, each cell bearing 4–6 cylindrical tubercles, 3μ wide by 5–7μ long, slightly colored; cysts appressed to the under side of the head, 6–10, somewhat united to one another; paraphyses none.—On *Cassia* (or *Caesalpinia*) sp., Zapotlan, State of Jalisco, Oct. 9, 1903, no. 5135.

31. Ravenelia spinulosa Diet. & Holw.—On *Cassia Holwayana* Rose (*C. multiflora* Mart. & Gal.), Cuautla, State of Morelos, Oct. 23, 1903, no. 5226; Oaxaca, Nov. 11, 1903, no. 5390: *C. Galeottiana* Mart., Tehuacan, Nov. 7, 1903, no. 5348: *Cassia* sp., Oaxaca, Nov. 10, 1903, no. 5372; Cuernavaca, Nov. 1, 1903, no. 5310.

32. **Ravenelia pulcherrima,** n. sp.—Uredosori amphigenous, in loose groups or scattered, round, small, 0.25–0.5^{mm} across, soon naked, subcuticular, cinnamon-brown, paraphyses numerous, intermixed with the spores; uredospores ellipsoid or oblong-globoid, 15–18 by 17–24μ, wall thin, 1.5–2μ, pale golden yellow, finely and closely echinulate-verrucose, pores 6–8, scattered, paraphyses large, capitate or spatulate, 12–18 by 35–55μ, smooth, walls of the stipe thin and nearly colorless, walls of the head much thickened above, 3–10μ, chestnut-brown: teleutosori amphigenous, small, scattered or confluent, subcuticular, blackish-brown; teleutospore-heads chocolate-brown, 6–7 cells across, 75–120μ in diameter, each spore bearing 4–5 inconspicuous papillae, semihyaline, 1–2μ high; cysts appressed to the underside the head, extending from periphery to pedicel; paraphyses none; pedicel short, colorless, deciduous.—On *Poinciana pulcherrima* L. (*Caesalpinia pulcherrima* Sw.), Yautepec, State of Morelos, Oct. 24, 1903, no. 5236 (type); Iguala, State of Guerrero, Nov. 4, 1903, no. 5337.

33. Ravenelia laevis Diet. & Holw.—Or *Indigofera jaliscenssi*Rose, Chapala, Oct. 5, 1903, no. 5108: *I. densiflora* Mart. & Gal.,

Cuernavaca, Sept. 26, 1898, no. 3225, Oct. 30, 1903, no. 5292; Oaxaca, Nov. 11, 1903, no. 5380; Amecameca, Oct. 20, 1903, no. 5203; Santa Fé, near City of Mexico, Oct. 18, 1903, no. 5167: *Indigofera* sp., Etzatlan, State of Jalisco, Oct. 2, 1903, no. 5091.

34. RAVENELIA INDIGOFERAE Tranz.—On *Indigofera cuernavacana* Rose, Cuernavaca, Oct. 30, 1903, no. 5296: *I. Conzattii* Rose, Mt. Alban, State of Oaxaca, Nov. 12, 1903, no. 5392.

35. RAVENELIA BRONGNIARTIAE Diet. & Holw.—On *Brongniartia podalyrioides* HBK., Iguala, State of Guerrero, Nov. 3, 1903, no. 5316.

36. RAVENELIA SIMILIS (Long).—On *Brongniartia podalyrioides* HBK., Guadalajara, Sept. 30, 1903, no. 5181.

37. RAVENELIA TALPA (Long).—On *Cracca Talpa* Rose (*Tephrosia Talpa* Wats.), Guadalajara, Oct. 12, 1903, no. 5151: *C. macrantha* (Wats.) Rose (*Tephrosia macrantha* Wats.), Etzatlan, State of Jalisco, Oct. 2, 1903, no. 5100.

The collection on *C. macrantha* shows some deviation from the type, the tubercles on the teleutospore-heads being larger, and the uredospores being slightly smaller, with germ pores more often scattered.

PURDUE UNIVERSITY,
Lafayette, Ind.